CLAIMS:

1. An isolated polynucleotide comprising:

(a) an isolated HSV LAT enhancer element;

(b) a first isolated LAT insulator/boundary region operably positioned upstream of said isolated LAT enhancer element; and

(c) a second isolated LAT insulatory/boundary region operably positioned downstream of said isolated LAT enhancer element.

2. The polynucleotide according to claim 1, wherein said LAT enhancer element comprises a contiguous nucleotide sequence from an HSV LAT 5′ exon.

3. The polynucleotide according to claim 1 or claim 2, wherein said LAT enhancer element consists essentially of a contiguous nucleotide sequence from an HSV LAT 5′ exon.

4. The polynucleotide according to any preceding claim, wherein said LAT enhancer element consists of a contiguous nucleotide sequence from an HSV LAT 5′ exon.

5. The polynucleotide according to any preceding claim, wherein said LAT enhancer element comprises a contiguous nucleotide sequence from about nucleotide 118,975 to about nucloetide 120,471 of an HSV LAT 5′ exon.

6. The polynucleotide according to any preceding claim, wherein said LAT enhancer element consists essentially of a contiguous nucleotide sequence from about nucleotide 118,975 to about nucloetide 120,471 of an HSV LAT 5′ exon.

7. The polynucleotide according to any preceding claim, wherein said LAT enhancer element consists of a contiguous nucleotide sequence from about nucleotide 118,975 to about nucloetide 120,471 of an HSV LAT 5′ exon.

8. The polynucleotide according to any preceding claim, wherein said LAT enhancer element consists of a contiguous nucleotide sequence from nucleotide 118,975 to nucloetide 120,471 of an HSV LAT 5′ exon.

9. The polynucleotide according to any preceding claim, further comprising at least a first promoter region operably positioned upstream of said LAT enhancer element, and downstream of said first LAT insulator/boundary region.

10. The polynucleotide according to any preceding claim, wherein said promoter region comprises an HSV LAP1 promoter.

11. The polynucleotide according to any preceding claim, wherein said promoter region consists essentially of an HSV LAP1 promoter.

12. The polynucleotide according to any preceding claim, wherein said promoter region consists of an HSV LAP1 promoter.

13. The polynucleotide according to any preceding claim, wherein said promoter region comprises an HSV LAP1 promoter that comprises a sequence region of from about nucleotide 117,938 to about 118,843 of said HSV LAP1 promoter.

14. The polynucleotide according to any preceding claim, wherein said promoter region comprises an HSV LAP1 promoter that consists essentially of a sequence region of from about nucleotide 117,938 to about 118,843 of said HSV LAP1 promoter.

15. The polynucleotide according to any preceding claim, wherein said promoter region comprises an HSV LAP1 promoter that consists of a sequence region of from about nucleotide 117,938 to about 118,843 of said HSV LAP1 promoter.

16. The polynucleotide according to any preceding claim, wherein said promoter region comprises an HSV LAP1 promoter that consists of a sequence region of from nucleotide 117,938 to 118,843 of said HSV LAP1 promoter.

17. The polynucleotide according to any preceding claim, wherein said first LAT insulator/boundary region comprises a contiguous nucleotide sequence from an HSV insulator region or an HSV boundary region.

18. The polynucleotide according to any preceding claim, wherein said first LAT insulator/boundary region comprises a contiguous nucleotide sequence from about nucleotide 8365 to about nucleotide 9273 of HSV1.

19. The polynucleotide according to any preceding claim, wherein said first LAT insulator/boundary region consists essentially of a contiguous nucleotide sequence from about nucleotide 8365 to about nucleotide 9273 of HSV1.

20. The polynucleotide according to any preceding claim, wherein said first LAT insulator/boundary region consists of a contiguous nucleotide sequence from about nucleotide 8365 to about nucleotide 9273 of HSV1.

21. The polynucleotide according to any preceding claim, wherein said first LAT insulator/boundary region consists of a contiguous nucleotide sequence from nucleotide 8365 to nucleotide 9273 of HSV1.

22. The polynucleotide according to any preceding claim, wherein said second LAT insulator/boundary region comprises a contiguous nucleotide sequence from an HSV insulator region or an HSV boundary region.

23. The polynucleotide according to any preceding claim, wherein said second LAT insulator/boundary region comprises a contiguous nucleotide sequence from about nucleotide 120,208 to about nucleotide 120,940 of HSV1.

24. The polynucleotide according to any preceding claim, wherein said second LAT insulator/boundary region consists essentially of a contiguous nucleotide sequence from about nucleotide 120,208 to about nucleotide 120,940 of HSV1.

25. The polynucleotide according to any preceding claim, wherein said second LAT insulator/boundary region consists of a contiguous nucleotide sequence from about nucleotide 120,208 to about nucleotide 120,940 of HSV1.

26. The polynucleotide o according to any preceding claim, wherein said second LAT insulator/boundary region consists of a contiguous nucleotide sequence from nucleotide 120,208 to nucleotide 120,940 of HSV1.

27. The polynucleotide according to any preceding claim, further comprising at least a first multiple cloning region operably positioned downstream of said first LAT insulator/boundary region and upstream of said LAT enhancer element.

28. The polynucleotide according to any preceding claim, wherein said first multiple cloning region further comprises a nucleic acid sequence that encodes a promoter or an enhancer sequence that is expressed in a mammalian host cell.

29. The polynucleotide according to any preceding claim, further comprising at least a second multiple cloning region operably positioned upstream of said second LAT insulator/boundary region and downstream of said LAT enhancer element.

30. The polynucleotide according to claim 29, wherein said second multiple cloning region further comprises at least a first nucleic acid sequence that encodes a therapeutic agent.

31. The polynucleotide according to claim 29 or claim 30, wherein said second multiple cloning region further comprises a nucleic acid sequence that encodes at least a first therapeutic agent selected from the group consisting of a peptide, a polypeptide, a ribozyme, a catalytic RNA molecule, an antisense oligonucleotide, and an antisense polynucleotide.

32. The polynucleotide according to claim 31, wherein said peptide or polypeptide is an antibody, a growth factor, a neurotrophic factor, a transcription factor, an anti-apoptotic factor, a proliferation factor, an enzyme, a cytotoxin, a transcription factor, an apoptotic factor, a tumor suppressor, a kinase, a cytokine, a lymphokine, or a protease.

33. The polynucleotide according to claim 30, wherein said second multiple cloning region further comprises at least a second distinct nucleic acid sequence that encodes at least a second distinct therapeutic agent selected from the group consisting of a peptide, an antibody, a protein, a polypeptide, a ribozyme, a catalytic RNA molecule, an antisense oligonucleotide, and an antisense polynucleotide.

34. The polynucleotide according to claim 33, wherein said catalytic RNA molecule specifically cleaves an mRNA encoding a transcription factor, an anti-apoptotic factor, a proliferation factor, a hormone receptor, a growth factor, an oncogenic peptide, or a growth factor polypeptide.

35. The polynucleotide according to claim 34, wherein said catalytic RNA molecule is a hammerhead or a hairpin ribozyme.

36. The polynucleotide according to any preceding claim, wherein said polynucleotide is from about 2000 to about 9000 nucleotides in length.

37. The polynucleotide according to any preceding claim, wherein said polynucleotide is from about 2500 to about 8000 nucleotides in length.

38. The polynucleotide according to any preceding claim, wherein said polynucleotide is from about 3000 to about 7000 nucleotides in length.

39. The polynucleotide according to any preceding claim, wherein said polynucleotide is from about 3500 to about 6000 nucleotides in length.

40. A vector comprising the polynucleotide in accordance with any one of claims 1 to 39.

41. The vector according to claim 40, wherein said vector is an Insulated Viral Artificial Chromosome vector.

42. The vector according to claim 40 or claim 41, further comprising a nucleic acid segment that encodes a heterologous therapeutic mammalian polypeptide or peptide.

43. The vector according to any one of claims 40 to 42, wherein said vector further comprises a promoter operably linked to said nucleic acid segment, and further wherein said promoter expresses said nucleic acid segment in a mammalian host cell.

44. The vector according to claim 40 or claim 41, wherein said vector is plasmid pIVAC_1.0.

45. A vector that comprises the polynucleotide of any one of claims 1 to 39, and a nucleic acid segment that encodes a therapeutic agent, wherein said segment is operably linked to a promoter that expresses said nucleic acid segment in a mammalian host cell to produce said therapeutic agent in said cell.

46. A viral vector, virion, or viral particle comprising the polynucleotide in accordance with any one of claims 1 to 39, or the vector in accordance with any one of claims 40 to 45.

47. The viral vector, virion, or viral particle according to claim 43, wherein said vector comprises a retroviral, adenoviral, adeno-associated viral, or a herpes viral vector.

48. The viral vector, virion, or viral particle according to claim 46 or claim 47, wherein said vector is a gutless HSV vector, a gutless AV vector, a gutless AAV vector, a recombinant HSV vector, a recombinant AV vector, or a recombinant AAV vector.

49. A plurality of viral particles comprising the polynucleotide in accordance with any one of claims 1 to 39.

50. The plurality of viral particles according to claim 49, wherein said particles are AV, AAV, or HSV particles.

51. A host cell comprising:

(a) the polynucleotide of any one of claims 1 to 39;

(b) the plasmid vector of any one of claims 40 to 45;

(c) the viral vector, virion, or viral particle of any one of claims 46 to 48; or

(d) the plurality of AV, AAV or HSV particles of claim 49 or claim 50.

52. The host cell according to claim 51, wherein said host cell is a mammalian host cell.

53. The host cell according to claim 51 or claim 52, wherein said host cell is a human host cell.

54. A composition comprising the polynucleotide of any one of claims 1 to 39, the plasmid vector of any one of claims 40 to 45, the viral vector, virion, or viral particle of any one of claims 46 to 48, the plurality of AV, AAV, or HSV particles of claim 49 or claim 50, or the host cell of any one of claims 51 to 53.

55. The composition according to claim 54, further comprising a pharmaceutical excipient.

56. The composition according to claim 55 or claim 55, further comprising a lipid, a liposome, a lipofection complex, a nanoparticle, or a nanocapsule.

57. The composition according to any one of claims 54 to 56, wherein said pharmaceutical excipient is formulated for administration to a human host cell.

58. The composition according to any one of claims 54 to 57, wherein said pharmaceutical excipient is formulated for injection.

59. The composition according to any one of claims 54 to 58, for use in therapy.

60. The composition according to any one of claims 54 to 59, for use in human therapy.

61. The composition according to any one of claims 54 to 60, for use in the therapy of cancer, diabetes, autoimmune disease, kidney disease, cardiovascular disease, pancreatic disease, liver disease, cystic fibrosis, muscular dystrophy, neurological disease, neurosensory dysfunction, stroke, ischemia, an enzyme deficiency, a psychological deficit, a neuromuscular disorder, an eating disorder, a neurological deficit or disease, a neuroskeletal impairment or disability, Alzheimer's disease, Huntington's disease, Parkinson's disease, pulmonary disease, a skin disorder, a burn, or a wound.

62. A kit comprising: (a) a component selected from the group consisting of the polynucleotide of any one of claims 1 to 39, the plasmid vector of any one of claims 40 to 45, the viral vector, virion, or viral particle of any one of claims 46 to 48, the plurality of AV, AAV, or HSV particles of claim 49 or claim 50, the host cell of any one of claims 51 to53, or the composition of any one of claims 54 to 61; and (b) instructions for using said kit.

63. The kit according to claim 60, formulated for diagnostic use.

64. The kit according to claim 60, formulated for therapeutic use.

65. The kit according to claim 60, formulated for prophylactic use.

66. Use of the composition according to of any one of claims 54 to 61, in the manufacture of a medicament for treating or ameliorating the symptoms of a disease, disorder, or dysfunction in an animal.

67. The use according to claim 66, in the manufacture of a medicament for treating or ameliorating the symptoms of a disease, disorder, or dysfunction in a mammal.

68. The use according to claim 66 or claim 67, in the manufacture of a medicament for treating or ameliorating the symptoms of a disease, disorder, or dysfunction in a human.

69. The use according to any one of claims 66 to 68, for use in the manufacture of a medicament for treating or ameliorating the symptoms of cancer, diabetes, autoimmune disease, kidney disease, cardiovascular disease, pancreatic disease, liver disease, cystic fibrosis, muscular dystrophy, neurological disease, neurosensory dysfunction, stroke, ischemia, an enzyme deficiency, a psychological deficit, a neuromuscular disorder, an eating disorder, a neurological deficit or disease, a neuroskeletal impairment or disability, Alzheimer's disease, Huntington's disease, Parkinson's disease, pulmonary disease, a skin disorder, a burn, or a wound.

70. A method for providing a heterologous therapeutic gene to a mammalian host cell, said method comprising the step of: providing to a population of mammalian host cells an AV, HSV, or an AAV virion or viral particle that comprises the vector of claim 45, in an amount and for a time effective to provide said heterologous therapeutic gene to said population of mammalian cells.

71. A method for preventing, treating or ameliorating the symptoms of a disease, dysfunction, or deficiency in a mammal, said method comprising administering to said mammal the vector of claim 45, the viral vector, virion, or viral particle of any one of claims 46 to 48, or the plurality of AV, AAV, or HSV particles of claim 49 or claim 50, in an amount and for a time sufficient to treat or ameliorate the symptoms of said disease, dysfunction, or deficiency in said mammal.